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SUBJECT: Summary of Access and Directory Control Modifications

This document summarizes the information relating to the proposed upcoming changes to directory control and access control. This document does not include any details of these changes but does reference other existing documents where appropriate.

The major purpose of the directory reformat is to permit the implementation of several access control changes. These changes are described in detail in the document Access Control Proposals. In summary these changes are:

- New directory access modes
- New directory ring brackets
- Maximum length (elimination of append access on non-directory segments)
- Initial ACLs (elimination of CACLs)
- Safety switch
- New daemon access (elimination of SPACL)
- One set of ring brackets per segment

The directory reformat will also permit the implementation of 256K segments. Of lesser importance, but also of significance will be the introduction of some new meters to better enable us to evaluate the performance of directory control. These meters are described in the document Directory Control Meters to be published shortly. The current user code table (UCT) will be eliminated. In order to minimize loss of performance due to fragmentation we will leave enough space for a small file map (4K segment) and three ACL entries in a branch. In this way a large majority of branches would be localized.

The document Work List for File System Changes describes the plan for implementing the above changes. This plan essentially has four parts.

Part A - Insure that all system segments (i.e., ring 0, system libraries, daemon owned, etc.) have ACLs that will map directly into the new scheme. This step makes Part B easier. No functional changes.

Part B - Perform directory reformatting, i.e., change file system and salvager to have new directory format and install via complete dump, cold boot, and complete reload. Functional changes are the implementation of 256K segments, having ring brackets on a per segment basis, elimination of the UCT, and the new metering.

Part C - Implement the new directory access attributes, directory ring brackets, initial ACLs, safety switch, and maximum length. CACLs, append permission on non-directory segments, and write permission necessary to delete a segment will still exist.

Part D - Disable CACLs, append access on non-directory segments, and the necessity for write permission to delete a segment.

Since Part B is the most difficult item, the general philosophy is to minimize this step as much as possible, therefore, Part C represents those featurers which do not have to be implemented to perform the directory reformatting.

Users will see no change due to Part A since it is really a setup step. Part B will introduce 256K segments and one set of ring brackets per segment to users. This should cause no compatability problems since 256K segments is a new feature and it is believed that no users currently use ring brackets.

With the installation of Part C the user will have to start contending with the compatability problems. At this point all the new features will have been introduced and the user will have until the installation of Part D to eliminate his usage of the obsolete mechanisms. Sufficient time will be allowed to elapse between parts C and D to permit users to make the necessary changes.